

College of Engineering Trivandrum
Department of Computer Science and Engineering

Application Software Development Lab
Lab Exam on Cycle 2 - Batch 1
Electricity bill calculator

Date : 24-11-2020
Time : 11 am to 1.30pm
Total Marks:**20**

1. Create a PL/SQL program to calculate the bill amount of a customer.
 - a. Write a function for **Energy charge** calculation. **(5 marks)**
 - b. Write a function for Net amount calculation in Bill table. Use a cursor to update the 'Net amount' and 'Bill date' (as today's date) in the Bill table. **(5 marks)**
 - c. Write a procedure to update the 'Bill amount' in the Customer table. **(5 marks)**
 - d. Create a trigger (to display a message "Previous dues for customer is <amount>") whenever the Bill amount is updated for a customer whose Last Bill payment = 'N'. **(5 marks)**

The basic table structure is given below.

Customer table:

Customer id	(5 digit unique id)
Meter Type	(3 phase or 1)
Previous Reading	(4 digit)
Current Reading	(4 digit)
Customer Type	(4 types of customers viz. Agricultural (A), Industrial (I), Commercial(C) and Residential(R))
Bill amount	
Last Bill payment	(values could be Y or N)

Bill table:

Customer id
Bill Date
Fixed charge { Single phase: Rs. X (X = your roll no + 40) Three phase : Rs. Y (Y = your roll no + 120) }
Energy charge
Surcharge
Net amount

The calculation details and examples are given below:

Net Amount Calculation (Bill Table) :

Net amount = Fixed charge + Energy charge + Surcharge

Fixed charge :

Single phase: Rs. X (X = your roll no + 40)

Three phase : Rs. Y (Y = your roll no + 120)

Surcharge

5% of energy charge for single phase

10% of energy charge for 3 phase

Energy charge calculation:

Energy charge= Units consumed * Rate

Units consumed = Current Reading - Previous Reading

Rate calculation: (units : 0-100) --- telescopic rate (see example)

Rs. 1 (A)

Rs. 1.25 (I)

Rs. 1.5 (C)

Rs. 1.3 (R)

Rate calculation: (units : 101-200) ----telescopic rate (see example)

Rs. 1.25 (A)

Rs. 1.3 (I)

Rs. 1.6 (C)

Rs. 1.4 (R)

Rate calculation: (units > 200)----non-telescopic rate (rate applicable for the whole units)

Rs. 1.75 (A)

Rs. 1.5 (I)

Rs. 2 (C)

Rs. 1.6 (R)

Example for net amount calculation

1. If units consumed = **50** for **R** (1 -phase):
 Energy Charge = $50 * 1.3 = 65$
 Surcharge = $0.05 * 65 = 3.25$
 Net amount = 40 (e.g. fixed charge =40) + $65 + 3.25 = 108.25$

2. If units consumed = **189** for **C** (3 -phase):
 Energy Charge = $100 * 1.5 + 89 * 1.6 = 292.4$
 Surcharge = $0.1 * 292.4 = 29.24$
 Net amount = 120 (e.g. fixed charge =40) + $292.4 + 29.24 = 441.64$

3. If units consumed = **350** for **I** (1 -phase):
 Energy Charge = $350 * 1.5 = 525$
 Surcharge = $0.05 * 525 = 26.25$
 Net amount = 40 (e.g. fixed charge =40) + $525 + 26.25 = 591.25$

Bill Amount Calculation (Customer table) :

If Last Bill payment = 'Y' then 'Bill amount' = 'Net amount' (from Bill table).

Else 'Bill amount' will be the sum of 'Net amount' values for that particular customer.

Example

In Bill table

Customer id	Bill Date	Fixed charge	Energycharge	Surcharge	Net amount
10005	13/10/2020	40	65	3.25	108.25
10005	13/08/2020	40	70	3.5	113.5
10004	13/10/2020	120	292.4	29.24	441.64

In Customer table

Customer Id	Meter type	Prev reading	Curr reading	Cust type	Last bill payment	Bill amount
10005	1	3500	3550	R	N	221.75
10004	3	4800	4989	C	Y	441.64